An Appreciation of Breeam Relative to the Cosmonomic Idea of Reality

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Sustainability assessment schemes risk the institutionalisation of a limited definition of sustainable construction. New, broader structures of knowledge and thinking relating to sustainability in the built environment are required. The 'Cosmonomic Idea of Reality' has been advanced as such a structure. The notional basis of the cosmonomic framework was explored and was shown to accord with six previously identified dimensions of sustainability. Using the mind-mapping technique and a set of mapping rules, the framework was compared with an established BREEAM scheme, to allow the shortcomings of this assessment method to be exposed. It was found that the BREEAM scheme neither sufficiently accommodated the sustainability dimensions nor each and every modality of the framework. In order to address the complexities of the sustainability challenge the BREEAM scheme must fully accord with a framework that more appropriately encapsulates the sustainability concept. Moreover, it should be better informed by project-specific concerns.

Keywords: assessment, framework, sustainability.

INTRODUCTION

In recent years attempts have been made to broaden the scope of building environmental assessment to encompass the concept of sustainability (Cole 2005). This notion seeks to balance the inherently interrelated yet frequently opposing aspects of environment, society and economy. These aspects interact over space and time and, in accordance with the idealised tenets of the related concept of sustainable development (WCED, 1987) should be shaped and influenced by participation in associated decision-making (Moir and Carter 2012). However, many schemes which claim to assess sustainability in the built environment continue to inadequately address the social and economic impacts of construction (Todd *et al.* 2001). Context-related spatial, temporal and participatory concerns are similarly ill-considered (Moir and Carter 2012). Building performance determined through such schemes often acts as a proxy for the achievement of built environment sustainability goals. Consequently, there is a risk that a limited definition of sustainable construction, misaligned to the notional essence of sustainability, will become institutionalised (Moir and Carter 2012). Therefore, it is evident that progress towards a sustainable future through construction theory and practice will require new, more extensive

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structures of knowledge and thinking than those offered by contemporary building performance assessment.

In response to this demand, Brandon and Lombardi (2011) advance the 'Cosmonomic Idea of Reality', a 'weltanschauung' (world view) conceived by the Dutch philosopher Herman Dooyeweerd (1894-1977), as a suitable framework. An appreciation of an established building assessment methodology, specifically an instance of the Building Research Establishment Environmental Assessment Method (BREEAM), relative to Dooyeweerd's cosmology was undertaken with a view to exposing the shortcomings of the methodology. The identified aspects of sustainability, namely environment, society, economy, space, time and participation (Moir & Carter, 2012) were shown to be encompassed by the cosmonomic framework. The analysis conducted sought to determine if the BREEAM scheme offers a similar level of correspondence. The scheme BREEAM New Construction 2011 (Non-Domestic Buildings) (BRE Global 2011) was selected as the comparator based on its anticipated common usage. The mind-mapping technique was used to establish associations between the framework and the scheme.

THE COSMONOMIC IDEA OF REALITY

The 'Cosmonomic Idea of Reality' (Dooyeweerd 1953-58) is a pluralist ontology. It is a universal conception founded on the theocentric premise that "nothing, not even theoretical thought, is absolute: it is all relative to the Creator God who, by the action of creation, gave everything meaning" (Brandon and Lombardi 2011: 218). Despite its ostensibly transcendental aspirations Dooyeweerd's cosmology can be readily applied in secular contexts. It is concerned with the notion of an independent external reality (i.e. cosmology) which influences and is influenced by those who are subject to it. This reality is composed of two 'sides', an entity side and a law side. The former pertains to systems and 'things' (i.e. all perceptible objects in the macrocosm) while the latter relates to the 'modalities' (i.e. essential characteristics) of these entities.

Where applied in the context of the built environment, cosmonomic theory is not intended to supplant existing sustainability rating systems, which are but one element of a development process which considers sustainability. Rather, it seeks to "bring together the diversity of interests necessary to assess the impact of the built environment and urban design on urban sustainable development" (Brandon and Lombardi 2011: 124). Nijkamp (2007) concurs, and highlights its explicit transdisciplinary and integrationist nature together with its suitability for comprehending the complexity of the city archetype (Lombardi and Basden 1997). The cosmonomic framework has been successfully used for the prospective and retrospective evaluation of built environment sustainability in a number of case studies (Lombardi 2009, Brandon and Lombardi 2011: 151-167).

Modalities

A modality is "an irreducible area of the functioning of the system [or entity]" characterised by its own internal order and unique laws (Brandon and Lombardi 2011: 219). These laws guide and enable the operation of the entity. For example, the laws of biology, associated with the 'biological' modality, govern the patent functioning of all living creatures. Laws which relate to lower-order modalities, and therefore the modalities themselves, tend to be determinative ('hard') whereas higher-order modality laws are more likely to be normative ('soft'). The framework upon which the theory of Dooyeweerd is based consists of fifteen ordered and interrelated modalities,

"derived by taking every large-scale kind of property that has been distinguished in the history of philosophy and science" (Brandon and Lombardi 2011: 221). Brandon and Lombardi (2011: 127) list these modalities, their general meanings and their proposed meanings within the context of sustainable development (Table 1). The modalities appeal to the identified dimensions of sustainability. The economic, social and spatial dimensions are (eponymously) accounted for, as is environment via the 'biological' through to the 'numerical' modalities. The dimensions of time and participation are implicit considerations of each modality (Brandon and Lombardi 2011: 139-145). Participation is an explicit feature of the 'juridical' modality (Brandon and Lombardi 2011: 130).

Table 9: The cosmonomic modalities, their meanings and sustainable development definitions (Brandon and Lombardi, 2011: 127)

Modality	Meaning	Sustainable Development definition
Numerical	Quantity	Numerical accounting
Spatial	Continuous extension	Spaces, shape and extension
Kinematics	Movement	Transport and mobility
Physical	Energy, mass	Physical environment, mass and energy
Biological	Life function	Health, biodiversity and eco-protection
Sensitive	Senses, feelings	People's perception towards the environment
Analytical	Discernment of entities	Analysis and formal knowledge
Historical	Formative power	Creativity and cultural development
Communicative	Information	Communications and the media
Social	Social intercourse	Social climate and social cohesion
Economic	Frugality	Efficiency and economic appraisal
Aesthetic	Harmony, beauty	Visual appeal and architectural style
Juridical	Retribution, fairness	Rights and responsibilities
Ethical	Love, morality	Ethical issues
Credal	Faith, trustworthiness	Commitment, interest and vision

Inter-modality relationships

Three types of relationships exist between the modalities (Brandon and Lombardi 2011: 220-221), of which two are directly relevant to this study. The first relationship is that laws associated with higher-order modalities are dependent on and require those of lower-order modalities. This is the dependency relation. It means that each modality (with the obvious exception of the lowest order 'numerical' modality) is founded on each of the lower-order modalities relative to it. Alternatively, each modality (with the obvious exception of the highest order 'credal' modality) anticipates in some respects those modalities above it. Thus, the modalities are arranged in a non-arbitrary nested progression, the so-called 'cosmonomic order of time' (Kalsbeek 1975). This relation serves to reinforce the applicability of all the modalities to the identified dimensions of sustainability.

The second relationship is that, as a subject, an entity can be simultaneously characterised by multiple modalities, depending on its operation. In other modalities it functions passively as an object. For example, animals have populations ('numerical'), occupy space ('spatial'), can move ('kinematics'), have form ('physical'), etc. and in many cases exhibit quite complex inter-species bonds and relationships ('social'). Across this range of modalities they are active as subjects. However, animals cannot perform financial transactions ('economic'), have no formal discernment of visual merit ('aesthetical') nor conception of fairness ('juridical'), etc. and are not influenced by aspirations or beliefs ('credal'). In this range they are the object of the modalities.

Therefore, for such entities the qualifying modality, or the highest subject (active) modality that endows the entity with its ultimate character and uniqueness (Nijkamp 2007), is the 'social' modality. Humans and the extended configurations in which they occur (e.g. communities), as more complex entities, are able to function as subjects in all fifteen modalities of the cosmonomic framework. They are distinguished by the 'credal' modality. The built environment is qualified by the 'physical' modality (Brandon & Lombardi 2011: 128-129).

MAPPING BREEAM TO THE COSMONOMIC FRAMEWORK

BREEAM New Construction 2011 (Non-Domestic Buildings) consists of nine essential categories and a further innovation category, each of which is comprised of a number of assessment areas, or 'issues'. These issues were mapped to the modalities in order to appreciate the scheme relative to the cosmonomic framework.

Qualifying and dependency modalities

The principle of the qualifying modality presents a legitimate means of mapping each issue to a modality of the cosmonomic framework. The qualifying modality for an issue can be readily determined from an examination of that issue's general aim and specific evaluation features. These latter attributes are assessment criteria, evidence requirements, and supplementary information (e.g. compliance notes, relevant definitions and calculation procedures). Where the qualifying modality has been established for an issue so, by virtue of the 'cosmonomic order of time', its lower-order dependency modalities are revealed. These modalities similarly apply to the issue. For the purposes of mapping, whether they are referenced explicitly or implicitly (if at all) by the issue is immaterial. The structure and logic of the cosmonomic framework dictates that these founding modalities are inherent in any entity distinguished by a qualifying modality (i.e. all entities). Thus, the dependency modalities can also be mapped to the issue, by default and without exception.

Higher-order modalities

Modalities of an order higher than that of the qualifying modality manifest invariably in all issues. However, in contrast to the intrinsic dependency modalities, the explicit or implicit nature of these higher-order modalities is more critical from a mapping perspective. This is because certain modalities that do not qualify any of the issues are sufficiently referenced, expressly or otherwise, across a significant number of issues to merit consideration when evaluating the modality coverage of the BREEAM scheme. These higher-order modalities, regardless of their disposition, are problematic. Enabled by the nested structure of the cosmonomic framework, they imply additional underlying modalities relative to them. These implied founding modalities in turn further infer comparatively lower-order modalities, and so on. This situation hinders the isolation of the higher-order modalities that are pertinent to an issue and imperils the relevance and manageability of the mapping process. Explicit associations between issues and modalities are unequivocally mapped. However, for the purposes of this mapping exercise there is a need to limit the obfuscating inference of additional higher-order modalities associated with an issue.

Therefore, implicitly referenced higher-order modalities relative to the qualifying modality are only mapped to an issue where they pertain to so-called 'directly implied' modalities (i.e. modalities whose inference is obvious). Modalities that can be successively inferred from these directly implied modalities are disregarded in the mapping protocol. In effect, only the 'qualifying modality of the implied entity' is

considered. As the process of implication can be subjective it is possible that implied higher-order modalities that defy this axiom are presented in the issue mind-maps. The innate integrating character of the cosmonomic framework makes such admittances almost unavoidable. However, if kept to a minimum they should not tangibly affect the mapping intent. Thus, a mind-map fragment for an issue identifies and presents that issue's qualifying modality, dependency modalities (either explicitly stated within the issue or inferred from the qualifying modality), and higher-order (relative to the qualifying modality) explicit and 'directly implied' modalities.

Mapping method

The BREEAM issues were mapped to the modalities of the cosmonomic framework using the software FreeMind (v0.0.9). Initially, the complete BREEAM scheme was transposed as a mind-map, organised in terms of the categories and their associated issues, with each identifiable assessment feature occupying a separate branch of the mind-map. Thereafter, associations between these features and the modalities of the cosmonomic framework were denoted by the application of an identifying label to each feature. A list of example built environment characteristics associated with the modalities (Brandon and Lombardi 2011: 130) was used as the basis for deciding whether or not an assessment feature could be mapped to a particular modality. This list was supplemented by further attributes identified from a review of pertinent literature. The mapping exercise was conducted from the perspective of an office building evaluation and therefore certain issues (specifically, 'Ene 07 – Energy efficient laboratory systems' and 'Ene 09 – Drying space') were out of scope. A summary of the detailed mapping of the BREEAM issues to the modalities of the cosmonomic framework is presented in Tables 2 and 3. In these digests 'D' denotes an association between an issue and a dependency modality, 'H' links an issue and a higher-order modality and Q' indicates an issue's qualifying modality.

ANALYSIS

The BREEAM scheme was analysed relative to the cosmonomic framework. It was found that the scheme appealed to each modality of the Dooyeweerd's cosmology, with some modalities having greater prominence than others. Every feature of each issue was found to a map to modality of the cosmonomic framework. However, crucially, relationships between the issues and all modalities, most notably the social, economic and aesthetic modalities, were found to be incomplete. (A consummate association between each issue and each modality would have resulted in a value in each of the cells in Tables 1 and 2). Full consideration of temporal and participatory concerns was also found to be lacking in the scheme.

Qualifying modalities

Qualifying modality coverage for the issues tended towards the harder end of the modality range, with a concentration on the 'physical' and the 'biological' modalities. This would seem to support previous conclusions that contemporary sustainability assessment is rooted in environmental considerations and performs weakly with respect to the social and economic aspects (Todd *et al.* 2001). Issues within each category were (perhaps unsurprisingly) found to have the same qualifying modality, although limited exceptions to this maxim were evident. For example, 'Hea 04 – Water quality' differs from the other issues within its associated category by being distinguished by the 'biological' modality rather than the 'sensitive' modality.

Credal, ethical and juridical modalities

The ‘credal’ modality is evident only in the issue ‘Man 01 – Sustainable procurement’, where assessment criteria seek to engender accord among key stakeholders through contractual agreements and the transparency of information.

Table 2: Summary of mapping of assessment issues (Management to Transport) to cosmonomic modalities

BREEAM		Cosmonomic Modalities														
Categories	Issues	Numerical	Spatial	Kinematics	Physical	Biological	Sensitive	Analytical	Historical	Comm.	Social	Economic	Aesthetic	Juridical	Ethical	Credal
Manage-ment	Ma	D	D	D	D	D	D	D	D	Q	H	H		H	H	
	Ma	D	D	D	D	D	D	D	D	Q	H	H	H	H	H	H
	Ma	D	D	D	D	D	D	D	D	Q		H		H		
	Ma	D	D	D	D	D	D	D	D	D	Q	H	H	H	H	
	Ma	D	D	D	D	D	D	D	D	D	D	Q		H		
Health and Wellbeing	He	D	D	D	D	D	Q	H	H	H				H		
	He	D	D	D	D	D	Q	H	H	H				H		
	He	D	D	D	D	D	Q	H	H	H				H		
	He	D	D	D	D	Q	H							H		
	He	D	D	D	D	D	Q	H		H				H	H	
	He	D	D	D	D	D	Q			H				H		
Energy	En	D	D	D	Q	H		H	H	H		H		H		
	En	D	D	D	Q	H		H	H	H		H		H		
	En	D	D	D	Q	H	H			H	H			H		
	En	D	D	D	Q	H	H	H	H	H		H		H		
	En	D	D	D	Q	H	H	H	H	H		H		H		
	En	D	D	D	Q	H		H	H					H		
	En	D	D	D	Q	H	H	H				H		H		
Transport	Tra	D	D	Q	H	H						H		H		
	Tra	D	D	Q	H	H						H		H		
	Tra	D	D	Q	H	H	H					H		H		
	Tra	D	D	Q	H	H						H		H		
	Tra	D	D	Q	H	H	H	H		H	H	H	H	H		

*D = dependency modality, **Q** = qualifying modality, H = higher-order modality*

Although it could be argued that commitment, interest and vision are reflected in the choice of issues to be assessed, gaming and strategies that seek to attain the most credits for the lowest possible cost may act to subvert this. Ethical deliberations within the scheme are largely anthropocentric. They are primarily expressed through issues relating to the appropriate sourcing of building components and aggregates within the Materials category and implied by the issues of the Waste category. The application of impartiality also extends to non-human species and non-living entities (e.g. landscapes) via the issues of the Land Use and Ecology category. However, these latter considerations are not overtly grounded in any manner of cogent egalitarian moral philosophy, such as Deep Ecology (Naess 1973), nor significantly extend beyond mere legislative duty. The juridical modality features strongly in the scheme. Indeed every issue has at least one feature that can be associated with this modality. This reflects the extent of technical and planning legislation applicable to contemporary construction practice within the built environment.

Aesthetic modality

Although much of building design is concerned with the appearance of constructed assets, the aesthetic modality does not feature strongly in the scheme. Where beauty and visual amenity have been considered by the scheme this is restricted to: a demand

Table 3: Summary of mapping of assessment issues (Water to Pollution) to cosmonomic modalities

BREEAM		Cosmonomic Modalities														
Categories	Issues	Numerical	Spatial	Kinematics	Physical	Biological	Sensitive	Analytical	Historical	Comm.	Social	Economic	Aesthetic	Juridical	Ethical	Credal
Water	Wa	D	D	D	D	Q						H		H		
	Wa	D	D	D	D	Q			H	H		H		H		
	Wa	D	D	D	D	Q			H	H		H		H		
	Wa	D	D	D	D	Q			H	H		H		H		
Materials	Ma	D	D	D	Q	H			H	H		H		H	H	
	Ma	D	D	D	Q	H			H	H				H	H	
	Ma	D	D	D	Q			H	H	H				H	H	
	Ma	D	D	D	Q	H				H				H	H	
	Ma	D	D	D	Q	H						H		H		
Waste	Ws	D	D	D	Q	H		H	H	H		H		H	H	
	Ws	D	D	D	Q							H		H	H	
	Ws	D	D	D	Q	H						H		H	H	
	Ws	D	D	D	Q							H		H	H	
Land Use and Ecol	LE	D	D	D	D	Q			H	H		H		H		
	LE	D	D	D	D	Q				H		H	H	H	H	
	LE	D	D	D	D	Q	H	H	H	H		H	H	H	H	
	LE	D	D	D	D	Q	H		H	H		H	H	H	H	
	LE	D	D	D	D	Q	H			H	H	H	H	H	H	
Pollution	Pol	D	D	D	D	Q			H	H				H		
	Pol	D	D	D	D	Q								H		
	Pol	D	D	D	D	Q		H	H	H				H		
	Pol	D	D	D	D	Q	H			H				H		
	Pol	D	D	D	D	Q	H		H					H		

D = dependency modality, ***Q*** *= qualifying modality, H = higher-order modality*

within the Considerate Contractor scheme relating to the appearance of the construction site ('Man 02 – Responsible construction practices'); non-specific direction that the consultation process associated with the development must consider aesthetic impacts ('Man 04 – Stakeholder participation'); the provision of pleasant external waiting areas for transport users ('Tra 05 – Travel plan'); and the notion of ecological harmony and balance implied by the issues of the Land Use and Ecology category. These somewhat insubstantial requirements are polarised, existing as either defined but relatively trivial or important but abstract imperatives, with the latter mode being particularly subjective and difficult to meaningfully encourage and assess. However, visual considerations are an important facet of sustainability. The ephemerality of high fashion can lead to the perceived obsolesce of buildings prior to the end of their technical, functional, economic and/or physical life. This is at odds with need for an enduring built environment. More optimistically, high quality design has to potential to instil wellbeing among building users and may facilitate social integration. This in turn can attract people and investment to an area and yield economic benefits (Brandon and Lombardi 2011: 136).

It has been suggested that innovative design, a perceived requirement of a sustainable built environment, flounders where excessively regulated. Thus de facto sustainability standards in the form of assessment schemes have been resisted by some sections of the building design community. While such an apprehension may be true, at the very least this mapping exercise draws attention to that fact that dialogue concerning aesthetics and their relation to sustainability needs to take place as part of the building design process, if not necessarily within the confines of a specific assessment scheme.

Economic and social modalities

The 'economic' modality implicitly maps to issues across a number of categories. These issues relate to rather oblique budgetary exigencies and attitudes towards finance (Management); the consumption of non-renewable resources, principally fossil-based fuels (Energy and Transport); indirect financial benefits realised through efficiencies and recycling schemes (Water, Waste and to a lesser extent Materials); and the use of land for non-development purposes (Land Use and Ecology). The 'social' modality is directly evident through specific requirements that encourage plurality, social relationships and interaction through consultation ('Man 04') and the Considerate Contractor scheme ('Man 02'). Moreover, this modality is implied through cohesion, competiveness and collaboration that shape building development processes ('Man 01'). However, only issues 'Man 04' and 'Man 05' are characterised by the social and economic modalities respectively, thus reinforcing previous declarations regarding the need to improve how BREEAM assesses these aspects.

Communicative, historical, analytical and sensitive modalities

All of the scheme categories contain issues that relate to the 'communicative' modality. This is to be expected as the effective delivery of high quality information is a hallmark of successful construction practice, something that BREEAM seeks to encourage and augment. The 'historical' modality is principally evident where technology, an application of cognition that builds on previous discoveries and learning, is harnessed. The substance of the 'analytical' modality is logic and distinction, which is practically applied as analysis and formal knowledge (Brandon and Lombardi 2011: 133). Associations with this modality can be found throughout the scheme, conspicuously in issues of the Management category. This modality is also represented by issues dealing with, for example, modelling software and the data associated with designing for visual and thermal comfort ('Hea 01 – Visual comfort' and 'Hea 02 – Indoor air quality' respectively). These issues and others, including those relating to the provision of peaceful surroundings (e.g. 'Man 03 – Construction site impacts'), security and noise (Health and Wellbeing), also appeal to the 'sensitive' modality.

Biological, physical and other lower-order modalities

The 'biological', 'physical' and other lower-order modalities are well-represented throughout the BREEAM scheme. The 'biological' modality characterises each issue in the Water, Land Use and Ecology, and Pollution categories. The 'physical' modality qualifies the Energy, Materials and Waste category issues. All issues of the Transport category are distinguished by the 'kinematics' modality. The 'kinematics', 'spatial' and 'numerical' modalities are evident, both explicitly and through the modality dependency relation, in all issues in all categories of the scheme.

Time

Considerations within the scheme relating to time appear primarily within the Management category. For instance, 'Man 01' specifies that seasonal commissioning activities are to be completed over a minimum 12-month period following occupation of the building. Similarly, ‘Man 04’ directs the client to commit to a post occupancy evaluation one year after the building commences its intended function. Although time is explicitly acknowledged in the issues of other categories (e.g. ‘LE 05 – Long term impact of biodiversity’) the temporal impacts of each and every modality are not addressed by the scheme. Even in the issue ‘Man 05 – Life cycle cost and service life planning’, where a clear attempt is made to consider financial requirements over time, this effort is limited to the option comparison of only two from four specific building elements (i.e. envelope, services, finishes and external spaces) rather than a comprehensive analysis of each and every building element and significant component, and indeed the building as a whole, over a range of envisaged life-spans. Importantly, the scheme does not require the prospective re-assessment of a building to determine if it is still functioning per its immediate post-construction assessment status. This deficiency represents a lost ‘analytical’ opportunity to work towards closing the gap between design intent and the realised artefact.

Participation

Allowing impacted parties to bring their faculties to bear on just what makes a development sustainable is another key attribute of sustainability. However, stakeholder participation is constrained within BREEAM to only a single issue (‘Man 04’). Here, consultation is specified with a range of stakeholders, including actual and potential building users, community representatives and other relevant bodies depending on the function of the development. There is a requirement to demonstrate that feedback from these parties has influenced the design. Ostensibly, this affords bodies that are peripheral to the development process but still impacted by it with a say in the achievement of the associated building. However, the intended extent of this influence is not defined and thus may be marginalised. Where projects are driven by high costs and/or are technologically complex the tangible inclusion of feedback in the final design from this latter type of stakeholder is likely to be limited.

CONCLUSIONS

Sustainability, as interpreted by Moir and Carter (2012), consists of the aspects of environment, society, and economy, which interact over space and time and require participation in their context-specific definition. The ‘Cosmonomic Idea of Reality’ offers a suitable lens through which to perceive this conception of sustainability in a built environment context. It provides a framework to further expose the deficiencies of building sustainability assessment, specifically those of a BREEAM scheme. A de novo set of mapping rules were formulated to allow the framework and the scheme to be compared. An analysis of the resultant mind-map revealed that although each and every issue feature of the scheme could be associated with a modality of framework considerable gaps in the BREEAM scheme were apparent when scrutinised relative to the cosmonomic structure.

Despite its aspiration as a means to assess sustainability and notwithstanding the intrinsic interrelatedness of the conventional sustainability dimensions, the environmental aspect dominates within the scheme. The qualitative and diffuse nature of social benefits is an extant problem of sustainability assessment that remains to be resolved. In particular, aesthetics are underrepresented. Furthermore, the lack of attention given to the quantitative economic dimension, particularly the rather trite

approach taken to life-cycle costing, is disappointing, especially when considering the emphatically econocentric views on sustainable development of Pearce (2005). The notion of space is partially addressed by the scheme, as evidenced by assessment issues which deal with impacts occurring within the development site boundary and beyond. However, the full extent of spatial coverage (from local to global) is limited to the environmental dimension. Temporal considerations fare little better. Although the future is inherently uncertain impacts over time are insufficiently considered by all issues. Moreover, participatory deliberations are poorly conceived and unenforceable. It is this last dimension of sustainability that the BREEAM scheme critically fails to address. Perhaps, analogous to the approach taken by Ding (2008), the weighting of BREEAM assessment categories and issues by stakeholders and other interested parties presents a possible solution to this problem. This activity could be facilitated by the mapping of the scheme to the cosmonomic framework, as applying weights to fifteen mapped modalities would be an ostensibly more manageable activity. However, as demonstrated through comparison with the cosmonomic framework, BREEAM New Construction 2011 (Non-Domestic Buildings), and by sensible extrapolation other related BREEAM schemes and similar rating systems, still has some way to go to fully address the complexities of the sustainability challenge.

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